

Memorandum

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DATE: December 1, 2000

PROJECT: Pittsfield SSERC – TO1

W.O. NO.: 20121.001.095

SUBJECT: Drainage Swale DS-1 Sampling Report
DCN GE-120100-AAFD

This memorandum has been prepared to present field sampling observations and analytical results for soil and sediment samples collected in the drainage swale (DS-1) which intersects the east bank of the Housatonic River at approximately Transect 74 in the 11/2 Mile Reach. Field sampling activities were conducted on October 3 and October 4, 2000. This memorandum includes descriptions of the following:

- Purpose and objectives
- Field sampling procedures and description
- Laboratory analytical procedures
- Analytical results

The activities described in this plan were conducted in accordance with project-wide and area specific planning documents. These planning documents include the following:

- Project Field Sampling Plan (00-0334)
- Project Quality Assurance Project Plan and Addendum (QAPP) (00-0305)
- Project Health and Safety Plan (HASP) (00-0313)
- Site Specific Health and Safety Plan (00-0475)

Purpose and Objectives

The purpose and main objective of the sampling was to assess PCB concentrations in soil and sediment within the subject drainage swale DS-1. No previous sampling had been conducted within DS-1, and potential PCBs in DS-1 could impact the remediated 11/2 Mile Reach if not controlled or removed.

Drainage Swale Description and Location

The attached figure depicts the location of DS-1. DS-1 starts north of the commercial buildings on Elm Street, runs across a portion of parcels #I9-5-1 & #I8-23-6 and discharges into the Housatonic River at the existing sampling transect T-72.

The first section of DS-1 closest to the river starts on the south (east) side of the river at transect T72 and heads approximately south south east 323 feet (ft) to the right angle bend at the Day Street storm sewer out fall. The drainage swale banks are generally steep and contain slabs of concrete and other construction debris. During the sampling event the channel in this portion of the DS-1 contained standing water from the drainage swale/river intersection to sample location FL001633. The remainder of the channel was dry with a small number of depressions containing small pools of water. This channel section of DS-1 also contained an abundance of concrete slabs and construction debris.

A second section of DS-1 section starts at the right angle bend at the Day Street storm sewer out-fall and extends west south west approximately 312-ft to the first existing ditch culvert. During the sampling event, this portion of the DS-1 channel was generally flat with gently sloping banks and no noticeable construction debris.

Field Sampling and Analytical Procedures

Soil and sediment sampling were conducted at pre-determined locations on transects spaced approximately 25-ft apart (see figure). The first transect was located 25 ft from the intersection of DS-1 and the Housatonic River. Transects were evenly spaced, continuing past the 90 degree bend at the Day street storm sewer out fall and ending at the existing DS-1 culvert. A total of 26 transects were laid out for sampling, and sample transects were oriented perpendicular to the ditch and extended across both sides of the ditch

Sediment sampling locations were located on each transect at the center line of the swale. Bank sample locations were located at mid-slope on each side of the swale on each of the first 13 transects moving away from the river. Bank samples were not collected past the 90 degree turn of the swale at the Day Street outfall (see figure).

Sampling protocols were conducted in accordance with the WESTON Field Sampling Plan (12 Mar 1999) for soil sampling (C.32) and sediment sampling (C.30). At each location, samples were collected at two discrete depth intervals below ground surface (0 to 0.5-ft bgs and 0.5 to 1.0-ft bgs). A small number of refusals (7) were encountered due to construction debris on the banks and in the channel. All sample locations were marked by the field sampling team using survey hub stakes and pin flags. After sampling was completed, sample points were surveyed by a licensed surveyor.

All soil and sediment samples were analyzed for PCBs at a fixed, off-site laboratory approved by CENAE. QA/QC samples were obtained in accordance with the requirements outlined in the project QAPP and Addendum (00-0305). WESTON has conducted data management and data

validation of sample analyses in accordance with the procedures outlined in the project QAPP. All analyses meet the Level III data quality objectives as outlined in the project QAPP.

Analytical Results

A total of 100 samples were analyzed for Aroclors and total PCBs. Table 1 shows the analytical results for samples collected from DS-1. Soils from the east bank have an average PCB concentration 38.46 parts per million (ppm) and 25.17 ppm for the 0.0 to 0.5' and 0.5 and 1.0' depth intervals respectively. The highest number of elevated PCB results occur in the section of the east bank of DS-1 closest to the river.

Along the west bank of DS-1 the average detected PCB concentrations are 12.24 ppm and 24.05 ppm for the 0.0 to 0.5' and 0.5 to 1.0' depth intervals respectively. The highest PCB concentration was detected in the 0.5 to 1.0' interval at sample location FL001633. This sample had a concentration of 158 ppm of PCBs. The surface (0.0 to 0.5') sample at this location had the second highest total PCB concentration (67 ppm) of samples collected on the west bank.

Twenty-three center channel sediment samples were collected for PCBs from the mouth of DS-1 to the storm sewer outfall located near the end of Day Street. The average detected PCB concentration was 0.52 ppm and 3.53 ppm for the 0.0 to 0.5' and 0.5 to 1.0' depth intervals respectively. The center channel sample collected nearest the river exhibited a PCB concentration of 13.4 ppm in the 0.5 to 1.0' interval.

Twenty-seven channel sediment samples, including three duplicate samples, were collected in the portion of DS-1 that extends after the right angle bend at the Day Street storm sewer out fall. The average concentration of PCBs in the 0.5 to 1.0' interval is, at 19.88 ppm, more than 4 times higher than the average PCB concentration detected in the 0 to 0.5' samples (4.65 ppm). The highest PCB concentration of 108 ppm was detected in the 0.5 to 1.0' sample at FL001670.

Conclusion

Based on analytical results, soils and sediments containing PCBs (mainly Aroclor-1254 and Aroclor-1260) are present in DS-1 ranging from undetected to concentrations up to 158 ppm. The highest concentrations of PCBs were detected in mid-slope locations of the east and west banks of DS-1. Lower concentrations of PCBs were present in the channel sediments. Analytical results indicate that PCB impacted sediments and soils are potentially transported to the river during precipitation events that produce enough storm water flow from the Day Street out fall to suspend impacted soils and sediments in the water column.

Table 1
Summary of Analytical Results for Drainage Swale 1

Location ID	Depth Interval (feet)	AROCLOR-1016 (Mg/Kg)	AROCLOR-1221(Mg/Kg)	AROCLOR-1232(Mg/Kg)	AROCLOR-1242(Mg/Kg)	AROCLOR-1248(Mg/Kg)	AROCLOR-1254(Mg/Kg)	AROCLOR-1260(Mg/Kg)	PCB, TOTAL(Mg/Kg)
FL001631	0.0 - 0.5	1.1 u	1.1 u	1.1 u	1.1 u	1.1 u	13	32	45
FL001631	0.5 - 1.0	2.4 u	2.4 u	2.4 u	2.4 u	2.4 u	26	43	69
FL001632	0.0 - 0.5	5.2 u	5.2 u	5.2 u	5.2 u	5.2 u	28	39	67
FL001632	0.5 - 1.0	5.7 u	5.7 u	5.7 u	5.7 u	5.7 u	73	85	158
FL001633	0.0 - 0.5	0.045 u	0.045 u	0.045 u	0.045 u	0.045 u	0.045 u	0.38	0.38
FL001633	0.5 - 1.0	0.098 u	0.098 u	0.098 u	0.098 u	0.098 u	0.098 u	1.6	1.6
FL001634	0.0 - 0.5	0.44 u	0.44 u	0.44 u	0.44 u	0.44 u	2.2 J	3.7	5.9 J
FL001635	0.0 - 0.5	0.05 u	0.05 u	0.05 u	0.05 u	0.05 u	0.22 J	0.3	0.52 J
FL001635	0.5 - 1.0	0.048 u	0.048 u	0.048 u	0.048 u	0.048 u	0.33	0.25	0.58
FL001636	0.0 - 0.5	4.9 u	4.9 u	4.9 u	4.9 u	4.9 u	42	98	140
FL001636	0.5 - 1.0	2.2 u	2.2 u	2.2 u	2.2 u	2.2 u	29	39	68
FL001637	0.0 - 0.5	6.1 u	6.1 u	6.1 u	6.1 u	6.1 u	6.1 u	110	110
FL001637	0.5 - 1.0	2.1 u	2.1 u	2.1 u	2.1 u	2.1 u	2.1 u	32	32
FL001638	0.0 - 0.5	0.53 u	0.53 u	0.53 u	0.53 u	0.53 u	4.1	4.6	8.7
FL001638	0.5 - 1.0	0.92 u	0.92 u	0.92 u	0.92 u	0.92 u	5.5	6.3	11.8
FL001639	0.0 - 0.5	0.1 u	0.1 u	0.1 u	0.1 u	0.1 u	0.61	0.42	1.03
FL001640	0.0 - 0.5	0.093 u	0.093 u	0.093 u	0.093 u	0.093 u	0.55 J	0.82	1.37 J
FL001641	0.0 - 0.5	0.1 u	0.1 u	0.1 u	0.1 u	0.1 u	0.1 u	0.36	0.36
FL001641	0.5 - 1.0	0.047 u	0.047 u	0.047 u	0.047 u	0.047 u	0.19 J	0.29	0.48 J
FL001642	0.0 - 0.5	0.56 u	0.56 u	0.56 u	0.56 u	0.56 u	0.56 u	6.7	6.7
FL001642	0.5 - 1.0	0.6 u	0.6 u	0.6 u	0.6 u	0.6 u	0.6 u	8.2	8.2
FL001643	0.0 - 0.5	1 u	1 u	1 u	1 u	1 u	8.9 J	6	14.9 J
FL001643	0.5 - 1.0	0.52 u	0.52 u	0.52 u	0.52 u	0.52 u	4.7 J	4.4	9.1 J
FL001644	0.0 - 0.5	0.097 u	0.097 u	0.097 u	0.097 u	0.097 u	0.097 u	0.22	0.22
FL001644	0.5 - 1.0	0.096 u	0.096 u	0.096 u	0.096 u	0.096 u	0.096 u	0.43	0.43
FL001645	0.0 - 0.5	0.92 u	0.92 u	0.92 u	0.92 u	0.92 u	6.4 J	8.9	15.3 J
FL001645	0.5 - 1.0	0.97 u	0.97 u	0.97 u	0.97 u	0.97 u	8.6 J	9.7	18.3 J
FL001646	0.0 - 0.5	0.44 u	0.44 u	0.44 u	0.44 u	0.44 u	0.44 u	1.6	1.6
FL001646	0.5 - 1.0	0.45 u	0.45 u	0.45 u	0.45 u	0.45 u	0.45 u	1.9	1.9
FL001647	0.0 - 0.5	0.096 u	0.096 u	0.096 u	0.096 u	0.096 u	0.096 u	0.3	0.3
FL001647	0.5 - 1.0	0.048 u	0.048 u	0.048 u	0.048 u	0.048 u	0.048 u	0.24 J	0.24 J
FL001648	0.0 - 0.5	1.1 u	1.1 u	1.1 u	1.1 u	1.1 u	9 J	16	25 J
FL001648	0.5 - 1.0	1 u	1 u	1 u	1 u	1 u	14 J	7.4	21.4 J
FL001649	0.0 - 0.5	0.11 u	0.11 u	0.11 u	0.11 u	0.11 u	0.11 u	0.96	0.96
FL001649	0.5 - 1.0	0.57 u	0.57 u	0.57 u	0.57 u	0.57 u	0.57 u	2.3	2.3
FL001650	0.0 - 0.5	0.098 u	0.098 u	0.098 u	0.098 u	0.098 u	0.098 u	0.43	0.43

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Location ID	Depth Interval (feet)	AROCLOR-1016 (Mg/Kg)	AROCLOR-1221(Mg/Kg)	AROCLOR-1232(Mg/Kg)	AROCLOR-1242(Mg/Kg)	AROCLOR-1248(Mg/Kg)	AROCLOR-1254(Mg/Kg)	AROCLOR-1260(Mg/Kg)	PCB, TOTAL(Mg/Kg)
FL001650	0.5 - 1.0	0.097 u	0.097 u	0.097 u	0.097 u	0.097 u	0.097 u	1.5	1.5
FL001651	0.0 - 0.5	0.47 u	0.47 u	0.47 u	0.47 u	0.47 u	3.7 J	2	5.7 J
FL001651	0.5 - 1.0	0.48 u	0.48 u	0.48 u	0.48 u	0.48 u	6.9 J	4.4	11.3 J
FL001652	0.0 - 0.5	0.11 u	0.11 u	0.11 u	0.11 u	0.11 u	0.11 u	1.1	1.1
FL001652	0.5 - 1.0	0.088 u	0.088 u	0.088 u	0.088 u	0.088 u	0.088 u	0.31	0.31
FL001653	0.0 - 0.5	0.1 u	0.1 u	0.1 u	0.1 u	0.1 u	0.1 u	0.57	0.57
FL001653	0.5 - 1.0	0.092 u	0.092 u	0.092 u	0.092 u	0.092 u	1.2 J	1.2	2.4 J
FL001654	0.0 - 0.5	0.2 u	0.2 u	0.2 u	0.2 u	0.2 u	3.1	4	7.1
FL001654	0.5 - 1.0	0.11 u	0.11 u	0.11 u	0.11 u	0.11 u	2.2 J	2.2 J	4.4 J
FL001655	0.0 - 0.5	0.1 u	0.1 u	0.1 u	0.1 u	0.1 u	0.1 u	0.75	0.75
FL001656	0.0 - 0.5	0.044 u	0.044 u	0.044 u	0.044 u	0.044 u	0.044 u	0.082	0.082
FL001656	0.5 - 1.0	1 u	1 u	1 u	1 u	1 u	6.6 J	10	16.6 J
FL001657	0.0 - 0.5	0.096 u	0.096 u	0.096 u	0.096 u	0.096 u	0.88	1	1.88
FL001657	0.5 - 1.0	0.19 u	0.19 u	0.19 u	0.19 u	0.19 u	2.4	2.1	4.5
FL001658	0.0 - 0.5	0.099 u	0.099 u	0.099 u	0.099 u	0.099 u	0.099 u	0.57	0.57
FL001658	0.5 - 1.0	0.1 u	0.1 u	0.1 u	0.1 u	0.1 u	0.1 u	0.34	0.34
FL001659	0.0 - 0.5	0.088 u	0.088 u	0.088 u	0.088 u	0.088 u	0.088 u	0.22	0.22
FL001660	0.0 - 0.5	0.2 u	0.2 u	0.2 u	0.2 u	0.2 u	3.7	2.2	5.9
FL001660	0.5 - 1.0	0.17 u	0.17 u	0.17 u	0.17 u	0.17 u	4.7	2.4	7.1
FL001661	0.0 - 0.5	1.1 u	1.1 u	1.1 u	1.1 u	1.1 u	33	7.3 J	40.3 J
FL001661	0.5 - 1.0	0.094 u	0.094 u	0.094 u	0.094 u	0.094 u	0.094 u	0.53	0.53
FL001662	0.0 - 0.5	0.0096 u	0.0096 u	0.0096 u	0.0096 u	0.0096 u	0.0096 u	0.047	0.047
FL001662	0.5 - 1.0	0.0091 u	0.0091 u	0.0091 u	0.0091 u	0.0091 u	0.0091 u	0.15	0.15
FL001663	0.0 - 0.5	0.1 u	0.1 u	0.1 u	0.1 u	0.1 u	1.4 J	1.2	2.6 J
FL001663	0.5 - 1.0	0.19 u	0.19 u	0.19 u	0.19 u	0.19 u	3.5	4.1	7.6
FL001664	0.0 - 0.5	0.085 u	0.085 u	0.085 u	0.085 u	0.085 u	0.68	0.85	1.53
FL001664	0.5 - 1.0	0.018 u	0.018 u	0.018 u	0.018 u	0.018 u	0.25	0.3 J	0.55 J
FL001665	0.0 - 0.5	0.14 u	0.14 u	0.14 u	0.14 u	0.14 u	1.5 J	1.5	3 J
FL001665	0.5 - 1.0	0.11 u	0.11 u	0.11 u	0.11 u	0.11 u	0.96 J	0.93	1.89 J
FL001666	0.0 - 0.5	0.24 u	0.24 u	0.24 u	0.24 u	0.24 u	3.7 J	3.4	7.1 J
FL001666	0.5 - 1.0	0.012 u	0.012 u	0.012 u	0.012 u	0.012 u	0.085	0.077	0.162
FL001667	0.0 - 0.5	0.24 u	0.24 u	0.24 u	0.24 u	0.24 u	3	2.9 J	5.9 J
FL001667	0.5 - 1.0	0.0099 u	0.0099 u	0.0099 u	0.0099 u	0.0099 u	0.17	0.13	0.3
FL001668	0.0 - 0.5	0.29 u	0.29 u	0.29 u	0.29 u	0.29 u	2.2 J	3.6	5.8 J
FL001668	0.5 - 1.0	1.1 u	1.1 u	1.1 u	1.1 u	1.1 u	24	17	41
FL001669	0.0 - 0.5	0.14 u	0.14 u	0.14 u	0.14 u	0.14 u	3.1 J	3.4	6.5 J

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FL001669	0.5 - 1.0	0.7 u	0.7 u	0.7 u	0.7 u	0.7 u	22 J	26	48 J
FL001670	0.0 - 0.5	0.26 u	0.26 u	0.26 u	0.26 u	0.26 u	4.4	6.9	11.3
FL001670	0.5 - 1.0	2.6 u	2.6 u	2.6 u	2.6 u	2.6 u	40	68	108
FL001671	0.0 - 0.5	0.13 u	0.13 u	0.13 u	0.13 u	0.13 u	2	4.1	6.1
FL001671	0.5 - 1.0	1.2 u	1.2 u	1.2 u	1.2 u	1.2 u	7.3 J	13	20.3 J
FL001672	0.0 - 0.5	0.13 u	0.13 u	0.13 u	0.13 u	0.13 u	1.3	2.3	3.6
FL001672	0.5 - 1.0	1.2 u	1.2 u	1.2 u	1.2 u	1.2 u	4.2 J	8.8	13 J
FL001673	0.0 - 0.5	0.089 u	0.089 u	0.089 u	0.089 u	0.089 u	0.31 J	0.67	0.98 J
FL001673	0.5 - 1.0	0.2 u	0.2 u	0.2 u	0.2 u	0.2 u	1.1 J	2.6	3.7 J
FL001674	0.0 - 0.5	0.096 u	0.096 u	0.096 u	0.096 u	0.096 u	0.64	1.3	1.94
FL001674	0.5 - 1.0	0.092 u	0.092 u	0.092 u	0.092 u	0.092 u	0.45	0.83	1.28
FL001675	0.0 - 0.5	2.5 u	2.5 u	2.5 u	2.5 u	2.5 u	17	61	78
FL001675	0.5 - 1.0	6 u	6 u	6 u	6 u	6 u	11	30	41
FL001676	0.0 - 0.5	0.096 u	0.096 u	0.096 u	0.096 u	0.096 u	0.9 J	0.74	1.64 J
FL001676	0.5 - 1.0	1.1 u	1.1 u	1.1 u	1.1 u	1.1 u	6.8	6.6	13.4
FL001677	0.0 - 0.5	2.2 u	2.2 u	2.2 u	2.2 u	2.2 u	9.2	26	35.2
FL001677	0.5 - 1.0	2 u	2 u	2 u	2 u	2 u	8.4	16	24.4
FL001678	0.0 - 0.5	2.6 u	2.6 u	2.6 u	2.6 u	2.6 u	8.4 J	17	25.4 J
FL001678	0.5 - 1.0	5.6 u	5.6 u	5.6 u	5.6 u	5.6 u	14 J	25	39 J
FL001679	0.0 - 0.5	0.02 u	0.02 u	0.02 u	0.02 u	0.02 u	0.24	0.23	0.47
FL001680	0.0 - 0.5	0.99 u	0.99 u	0.99 u	0.99 u	0.99 u	4.6 J	8.1	12.7 J
FL001681	0.0 - 0.5	0.096 u	0.096 u	0.096 u	0.096 u	0.096 u	0.62 J	1.4	2.02 J
FL001681	0.5 - 1.0	0.1 u	0.1 u	0.1 u	0.1 u	0.1 u	0.28	0.37	0.65

Notes:

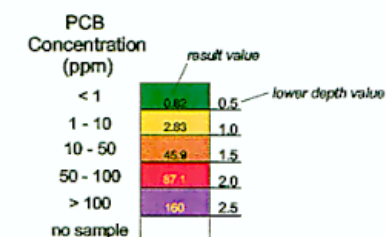
u = Indicates the compound was analyzed for but not detected and reports the detection value.

J = Indicates the compound was analyzed for but the result has an estimated value.

Mg/Kg = milligrams per kilogram

LEGEND:

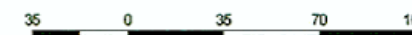
- ▲ EPA_COE Sample Locations
- Surface Water
- 10-year Floodplain
- Buildings
- Property Boundary



Note: Base features derived from BBL drawings.



Scale in Feet



Housatonic River Project
Pittsfield, Massachusetts

FIGURE 1
PARCELS I8-23-6 AND I9-5-1
DRAINAGE SWALE
STACK BAR MAP

